

CLAIMS

1. A multi-piece golf ball comprising:

a core;

a first intermediate layer;

5 a second intermediate layer; and

a cover, wherein

the first intermediate layer comprises a plurality of ribs formed on the core,

10 the second intermediate layer is placed in concave portions surrounded by the ribs,

the cover forms an outermost layer,

the ribs extend in such a manner that the widths thereof become wider from the cover side to the core side,

15 the concave portions are formed into a cone-like shape by the side surfaces of the ribs,

the hardnesses of the core, the first intermediate layer and the second intermediate layer are different from each other, and

20 the hardness of the first intermediate layer is greater than that of the second intermediate layer.

2. A multi-piece golf ball according to Claim 1, wherein the hardness of the core is less than that of the second intermediate layer.

3. A multi-piece golf ball according to Claim 1, wherein the hardness of the core is greater than that of the first intermediate layer.

5           4. A multi-piece golf ball according to Claim 1, wherein the rib height is in the range from 6.4 to 11.2 mm.

          5. A multi-piece golf ball according to Claim 1, wherein the diameter of the core is in the range from 15.1  
10   to 28.3 mm.

          6. A multi-piece golf ball according to Claim 1, wherein the ribs extend along three great circles drawn around the core so as to intersect each other at right  
15   angles.

          7. A multi-piece golf ball according to Claim 1, wherein each of the ribs is provided with a notch so as to form a passageway between adjacent concave portions.  
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          8. A multi-piece golf ball according to Claim 7, wherein  
          the ribs extend along three great circles drawn around the core so as to intersect each other at right  
25   angles,

each circular arc section of the ribs divided at the intersections of the great circles is provided with a notch, and

the notch has a plane that extends from one point  
5 of the normal line of the core passing through the intersection of the great circles toward the circular arc section, the plane having an angle that is not smaller than 90° relative to the normal line.

10 9. A multi-piece golf ball according to Claim 7, wherein

the ribs extend along three great circles drawn around the core so as to intersect each other at right angles,

15 each circular arc section of the ribs divided at the intersections of the great circles is provided with a notch,

the notch is formed in the middle of the circular arc section in the circular direction and has two planes  
20 each extending toward the intersection side from one point on the normal line of the core passing through the mid point of each circular arc section in the circular direction, and

the angle formed between each of the planes and  
25 the normal line is 45 to 48°.

10. A method for manufacturing a multi-piece golf ball having a core, a first intermediate layer, a second intermediate layer and a cover comprising the steps of:

5       forming a spherical core;

          preparing a first mold having a spherical core receiving part corresponding to the surface of the core, and a cavity having a plurality of grooves formed along the surfaces of the core receiving part, the grooves  
10       having substantially the same depth measured from the surface and the width becoming narrower as the grooves become deeper;

          forming a first intermediate layer having a plurality of ribs, after placing the core in the core  
15       receiving part of the first mold, by filling the cavity with a material having a hardness or a specific gravity different from that of the core;

          preparing a second mold having a spherical cavity corresponding to the outermost diameter of the first  
20       intermediate layer;

          forming a second intermediate layer by placing a half-finished product comprising a core and a first intermediate layer released from the first mold in a cavity of the second mold, and filling concave portions  
25       surrounded by the ribs with a material having a hardness

or specific gravity different from that of the core and the first intermediate layer; and

forming a cover on the second intermediate layer.

5           11. A method for manufacturing a multi-piece golf ball according to Claim 10, wherein the intermediate layers are formed in such a manner that the hardness of the first intermediate layer becomes greater than that of the second intermediate layer by selecting the materials  
10 for the intermediate layers.

          12. A method for manufacturing a multi-piece golf ball according to Claim 11, wherein the core is formed so as to have a hardness less than that of the second  
15 intermediate layer by selecting the material for the core.

          13. A method for manufacturing a multi-piece golf ball according to Claim 11, wherein the core is formed so as to have a hardness greater than that of the first  
20 intermediate layer by selecting the material for the core.

          14. A method for manufacturing a multi-piece golf ball according to Claim 10, wherein the inside diameter of the core receiving part of the first mold is 15.1 to 28.3  
25 mm.

15. A method for manufacturing a multi-piece golf ball according to Claim 10, wherein the depth of the grooves forming the cavity in the first mold is 6.4 to  
5 11.2 mm.

16. A method for manufacturing a multi-piece golf ball according to Claim 10, wherein the cavity of the first mold is so structured that a plurality of grooves  
10 communicate with each other to form at least one closed region, and at least one shallower portion is formed in the grooves.

17. A mold for forming a first intermediate layer  
15 of a multi-piece golf ball according to Claim 1 comprising:

a spherical core receiving part corresponding to the surface of the core; and

a cavity having a plurality of grooves formed  
20 along the surfaces of the core receiving part, the plurality of grooves having substantially the same depth measured from the surface and the width becoming narrower as the grooves become deeper.

25 18. A mold for forming a second intermediate

layer of a multi-piece golf ball according to Claim 1 comprising:

a spherical cavity corresponding to the outermost diameter of the first intermediate layer.